

WHAT IS CLAIMED IS:

1. A method for operating an optical disk memory comprising the steps of:
- 5 introducing an optical disk having a surface protected by a protective film comprising a diamond-like carbon having a thickness of 500Å or less; irradiating a semiconductor laser light onto said optical disk through said diamond-like carbon; wherein the number of pin-holes in said diamond-like carbon is 30/mm<sup>2</sup> or less.
- 10 2. A method according to claim 1 wherein said protective film is formed on the surface of said optical disk without heating.
3. A method according to claim 1 wherein said optical disk memory is a compact disk.
- 15 4. A method according to claim 1 wherein film quality of said diamond-like carbon is measured in accordance with Raman spectroscopy.
5. A method according to claim 1 wherein the thickness of said diamond-like carbon is 50Å or more.
6. A method according to claim 1 wherein said semiconductor laser light has a wavelength of 700 to 800 nm.
- 20 7. A method according to claim 1 wherein said semiconductor laser light is a visible light.

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8. A method for operating an optical disk memory comprising the steps of:  
introducing an optical disk having a surface protected by a protective film comprising a diamond-like carbon having a thickness of 500Å or less;  
5 irradiating a semiconductor laser light onto said optical disk through said diamond-like carbon;  
wherein the number of pin-holes in said diamond-like carbon is 30/mm<sup>2</sup> or less;  
wherein said diamond-like carbon contains at least one of element  
10 selected from the group consisting of Si, B, N, P and F.
9. A method according to claim 8 wherein said protective film is formed on the surface of said optical disk without heating.
10. A method according to claim 8 wherein said optical disk memory is  
15 a compact disk.
11. A method according to claim 8 wherein film quality of said diamond-like carbon is measured in accordance with Raman spectroscopy.
12. A method according to claim 8 wherein the thickness of said diamond-like carbon is 50Å or more.
- 20 13. A method according to claim 8 wherein said semiconductor laser light has a wavelength of 700 to 800 nm.
14. A method according to claim 8 wherein said semiconductor laser light is a visible light

15. A method for operating an optical disk memory comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a diamond-like carbon having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said substrate through said diamond-like carbon;

wherein the number of pin-holes in said diamond-like carbon is 30/mm<sup>2</sup> or less.

16. A method according to claim 15 wherein said protective film is formed on the surface of said substrate without heating.

17. A method according to claim 15 wherein said optical disk memory is a compact disk.

18. A method according to claim 15 wherein film quality of said diamond-like carbon is measured in accordance with Raman spectroscopy.

19. A method according to claim 15 wherein the thickness of said diamond-like carbon is 50Å or more.

20. A method according to claim 15 wherein said semiconductor laser light has a wavelength of 700 to 800 nm.

21. A method according to claim 15 wherein said semiconductor laser light is a visible light.

22. A method for operating an optical disk memory comprising the steps of:



introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said optical disk through said hard-carbon coating;

5 wherein the number of pin-holes in said hard-carbon coating is 30/mm<sup>2</sup> or less.

30. A method according to claim 29 wherein said protective film is formed on the surface of said optical disk without heating.

10 31. A method according to claim 29 wherein said optical disk memory is a compact disk.

32. A method according to claim 29 wherein film quality of said hard-carbon coating is measured in accordance with Raman spectroscopy.

33. A method according to claim 29 wherein the thickness of said hard-carbon coating is 50Å or more.

15 34. A method according to claim 29 wherein said semiconductor laser light has a wavelength of 700 to 800 nm.

35. A method according to claim 29 wherein said semiconductor laser light is a visible light.

20 36. A method for operating an optical disk memory comprising the steps of:  
introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;



irradiating a semiconductor laser light onto said substrate through  
said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is  
30/mm<sup>2</sup> or less

5 44. A method according to claim 43 wherein said protective film is  
formed on the surface of said substrate without heating.

45. A method according to claim 43 wherein said optical disk memory  
is a compact disk.

10 46. A method according to claim 43 wherein film quality of said hard-  
carbon coating is measured in accordance with Raman spectroscopy.

47. A method according to claim 43 wherein the thickness of said hard-  
carbon coating is 50Å or more.

48. A method according to claim 43 wherein said semiconductor laser  
light has a wavelength of 700 to 800 nm.

15 49. A method according to claim 43 wherein said semiconductor laser  
light is a visible light.

50. A method for operating an optical disk memory comprising the steps  
of:

20 introducing a substrate made of an organic resin or an industrial  
plastic material, said substrate having a surface protected by a protective film  
comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said substrate through  
said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm<sup>2</sup> or less;

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

5 51. A method according to claim 50 wherein said protective film is formed on the surface of said substrate without heating.

52. A method according to claim 50 wherein said optical disk memory is a compact disk.

10 53. A method according to claim 50 wherein film quality of said hard-carbon coating is measured in accordance with Raman spectroscopy.

54. A method according to claim 50 wherein the thickness of said hard-carbon coating is 50Å or more.

15 55. A method according to claim 50 wherein said semiconductor laser light has a wavelength of 700 to 800 nm.

56. A method according to claim 50 wherein said semiconductor laser light is a visible light.

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